



UNITED STATES DEPARTMENT OF COMMERCE
National Telecommunications and
Information Administration
Washington, D.C. 20230

JAN 20 2010

Ms. Mindel De La Torre
Chief of the International Bureau
Federal Communications Commission
445 12th Street SW
Washington, DC 20554

Dear Ms. De La Torre:

The National Telecommunications and Information Administration (NTIA), on behalf of the Executive Branch agencies, approves the release of two draft Executive Branch proposals for WRC-12 agenda items 1.11 and 1.12.

For agenda item 1.11, NTIA proposes a primary allocation to the space research service (Earth-to-space) in the band 22.55-23.15 GHz to support manned and unmanned missions. NTIA also proposes a power flux-density limit for aircraft stations in the 37-38 GHz band to protect services under agenda item 1.12.

NTIA considered the Federal agencies' input toward the development of U.S. proposals for WRC-12. NTIA forwards this package for your consideration and review by your WRC-12 Advisory Committee. Dr. Darlene Drazenovich is the primary contact from my staff.

Sincerely,

Karl B. Nebbia
Associate Administrator
Office of Spectrum Management

UNITED STATES OF AMERICA

DRAFT PROPOSALS FOR THE WORK OF THE CONFERENCE

Agenda Item 1.11: *to consider a primary allocation to the space research service (Earth-to-space) within the band 22.55-23.15 GHz, taking into account the results of ITU-R studies, in accordance with Resolution 753 (WRC-07)*

Background Information: Downlink (space-to-Earth) transmissions will operate in the 25.5-27.0 GHz space research service (SRS) allocation to support the SRS missions in near Earth orbit, including missions in transit to the moon and at or near the moon. Countries will use this 1.5 GHz wide downlink band for both scientific data retrieval and voice/video communication with the Earth. However, there is a need for a companion uplink (Earth-to-space) band to provide the mission data, voice/video communications, and command and control links to support manned and unmanned missions. The proposed SRS allocation at 23 GHz will fulfill this need for the global space science community.

Space agencies throughout the world require 600 MHz of uplink spectrum due to the potential for many concurrent exploration-related systems, the large bandwidth requirements for these systems, synergistic operations with existing data relay systems, selection of frequencies due to ranging constraints, and the evolution, growth, and complexity of those systems over a period of 20-30 years.

- 1) Space agencies require their own segments of spectrum for lunar and many Lagrangian missions since antenna discrimination is not possible. Any spacecraft around the moon and some of those with small orbit apogees around the L1 or L2 points can be situated within the main-beam lobe of other space agency antennas.
- 2) The specific RF carrier frequencies selected will often be coupled with internationally agreed channels for data relay systems in order to provide global support either via an earth station or via a data relay satellite. These data relay channels have a spacing of 60 MHz, irrespective of the actual bandwidth.
- 3) There is a fixed turn-around ratio required between the Earth-to-space link around 23 GHz and the corresponding space-to-Earth link in the 25.5-27 GHz band. This is required for ranging purposes and further limits the choice of available frequencies as it requires a suitable available companion frequency around 26 GHz.

Proposals from a number of administrations to WRC-07 covered the entire band 22.55 – 23.55 GHz. However, compatibility concerns expressed at WRC-07 with respect to the existing HIBLEO-2 system that operates above 23.18 GHz led to a compromise that limited the bandwidth under consideration to 600 MHz.

Considering the inherently limited number of these large SRS earth stations and their remote locations, ITU-R sharing studies between SRS (Earth-to-space) and the fixed, inter-satellite and mobile services in the 22.55-23.55 GHz band determined that sharing between a new SRS

(Earth-to-space) allocation in the 22.55-23.15 GHz band and the existing services in the 22.55-23.55 GHz band is feasible and will not cause harmful interference to their existing operations.

Proposal:

ARTICLE 5

Frequency allocations

Section IV – Table of Frequency Allocations (See No. 2.1)

MOD USA/AI1.11/1

22-24.75 GHz

Allocation to services		
Region 1	Region 2	Region 3
<u>22.55-23.55</u> 15	FIXED INTER-SATELLITE 5.338A MOBILE <u>SPACE RESEARCH SERVICE (Earth-to-space)</u> 5.149	
22.55 <u>23.15-23.55</u>	FIXED INTER-SATELLITE 5.338A MOBILE 5.149	

Reason: To provide a needed companion uplink (Earth-to-space) band for the transmission of mission data and command and control links for future space missions.

ARTICLE 21

Terrestrial and space services sharing frequency bands above 1 GHz

Section III – Power limits for earth stations

MOD USA/AI1.11/2

TABLE 21-3 (*end*) (WRC-03~~12~~)

Frequency band	Services
17.7-18.1 GHz	Fixed-satellite
<u>22.55-23.15 GHz</u>	Earth exploration-satellite
27.0-27.5 GHz ⁶ (for Regions 2 and 3)	Mobile-satellite
27.5-29.5 GHz	Space research
31.0-31.3 GHz (for the countries listed in No. 5.545)	
34.2-35.2 GHz (for the countries listed in No. 5.550 with respect to the countries listed in No. 5.549)	

Reason: The band 22.55-23.15 GHz is added to Table 21-3 to ensure protection of terrestrial services consequential to the addition of the SRS uplink allocation.

UNITED STATES OF AMERICA

DRAFT PROPOSALS FOR THE WORK OF THE CONFERENCE

Agenda Item 1.12: *to protect the primary services in the band 37-38 GHz from interference resulting from aeronautical mobile service operations, taking into account the results of ITU-R studies, in accordance with Resolution 754 (WRC-07)*

Background Information: Countries are implementing space research service (SRS) earth station receivers in the 37-38 GHz band to support manned missions for both near Earth and deep space distances. Use of the wider bandwidth available in the 37-38 GHz band is necessary to support the increasing data requirements of planned manned missions.

The ITU studied sharing between systems in the space research service (SRS), fixed service (FS), and fixed-satellite service (FSS) and potential systems in the aeronautical mobile services (AMS) in the 37-38 GHz band. The sharing studies indicate that high power emissions from typical aeronautical mobile transmitters would pose a high probability for causing harmful interference to receiving earth stations of the space research service and fixed-satellite service, but that lower powered aircraft stations could be compatible, if they meet a specified pfd mask. These studies also found that transmissions from the high-density fixed service (HDFS) systems could interfere with the airborne receivers of the AMS.

The aviation industry anticipates increasing demand for applications to be installed onboard aircraft for intra-aircraft communications, called Wireless Avionics Intra Communications (WAIC). WAIC systems will be low power applications intended to support data, voice, and video communications between systems on an aircraft, including communications systems used by the crew. Wireless sensors located at various points throughout the aircraft will be used to wirelessly monitor the health of the aircraft structure and all of its critical systems, and communicate this information within the aircraft. WAIC transmissions will not provide air-to-ground, air-to-satellite, or air-to-air communication. They will not include communications with consumer devices, such as Radio Local Area Network (RLAN) devices that are brought on board the aircraft by passengers. Therefore, since these systems are for aviation personnel use and not the general flying public, such systems may be able to meet the pfd limits needed to protect other allocated services.

Proposal:

ARTICLE 5

Frequency allocations

Section IV – Table of Frequency Allocations (See No. 2.1)

MOD

USA/A11.12/1

37-38 GHz

Allocation to services		
Region 1	Region 2	Region 3
37-37.5	FIXED MOBILE SPACE RESEARCH (space-to-Earth) 5.547 <u>ADD 5.AMS</u>	
37.5-38	FIXED FIXED-SATELLITE (space-to-Earth) MOBILE SPACE RESEARCH (space-to-Earth) Earth exploration-satellite (space-to-Earth) 5.547 <u>ADD 5.AMS</u>	

ADD USA/AI1.12/2

5.AMS In the band 37-38 GHz, the power flux-density radiated by any device or transmitter on an aircraft station shall not exceed, at the surface of the Earth using free space loss, -227 dB (W/m²) in any 1 Hz bandwidth.

Reason: In accordance with the agenda item, earth stations of the space research service, the fixed satellite service, and stations of the fixed service will be protected in the band 37-38 GHz by the application of a power flux-density (PFD) limit at the surface of the Earth on the emissions radiated by any device on an aircraft in flight or on the ground.